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NATIONAL LABORATORY PROGRAMS

GRADUATE STUDENT DATA

Introduction:

We are pleased to be able to present this book of summary sketches of the work sponsored by the Advanced Technology R&D Program of the Department of Energy's (DOE) Division of High Energy Physics. The work summarized here represents grants to over 35 universities, industry, and other Federal agencies (NIST and NRL), which we usually call the "University Program," as well as directed funds to groups at the National Laboratories. A very broad spectrum of technologies is covered, ranging from the metallurgical optimization of superconductors to advanced acceleration techniques, such as laser and plasma acceleration of particles. Figs. 1 and 2 show the distribution of these activities by discipline and by funding level. Overall, the Advanced Technology R&D program is an approximately $24 million effort, with about $13.5 million in the University Program in fiscal year 2001 and about $10.5 million at the national laboratories. Additional work in small businesses is supported through the Small Business Innovation Research (SBIR) grants at an annual level of about $15 million. The SBIR funding set aside is mandated by law, and the work is described elsewhere.

The criteria for the work that we categorize as "Advanced Technology R&D" is that it is not related to any specific project or potential project but rather addresses more fundamental accelerator physics and technology issues for the purpose of advancing the frontiers in these areas, with a specific focus on topics that may be applicable to high energy physics. The University Program was first funded in 1982, although a very limited number of university grants for research in accelerator physics were in place as early as 1975. It was created on the recommendation of a 1980 HEPAP Subpanel that the HEP program provide a venue for funding work in accelerator physics and technology R&D, particularly topics of very high risk but with very high potential payoff that were unlikely to be supported through our usual national laboratory technology R&D programs. The present University Program continues to follow this policy. As an example, it does not support R&D in support of the Next Linear Collider (NLC) or the muon collider/neutrino source, although there is R&D on these machines at universities that are funded through other parts of the HEP program. As the Advanced Technology R&D program has progressed, it became clear that some of the topics could beneficially be carried out in the HEP supported national laboratories, and so funds separate from the University Program were found for the laboratories as noted above.

Each of the research summaries was prepared by the principal investigator for that research and represents that individual's view of the work performed. The summaries are snapshots of programs as of September 2001. Later work is obviously not covered. Included at the end of each summary are lists of the group's recent talks and papers published, and a list of current persons working on the research projects supported by the grant. For those persons wishing to obtain additional information about the research described, contact information for each principal investigator can be found at the end of the summary.